

HEALING UNDER A MOIST BLOOD-CLOT IN ACCIDENTAL WOUNDS.

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THE surgical care of accident cases presents many complications not met with in the practice of surgeons whose work lies in the direction of laparotomies for tumors, orthopaedics, or when points of election can be chosen. The points of election in traumatic surgery are the points that are left, and we must make the best of the circumstances as we find them. Not only is this so in regard to the location of operation, but the field presents a different picture.

The one, say, amputation of the thigh for sarcoma, is washed, shaved and cleansed with antiseptics hours before the knife is taken up; the other, a crushed knee for example, presents a dirty field around the wound, with grime and soot, grease and tar ground into the very wound itself, not to mention the local shock to tissues, out of which the surgeon may be called on to fashion his flaps.

Should these agents not be detrimental enough it may generally be counted on that the "first aid" rendered by the lay friend will have filled the cup of sepsis to the brim with his infected hands and his detrimental panaceas.

For these reasons aseptic results after traumatism rightly outshine like results after wounds of the surgeon's own making.

Indeed, one can agree with the author who says, "suppuration in a well-regulated operation should occur as seldom as an accident on a well-regulated railway."

As a matter of fact, I have ceased to have much anxiety on that score when I have the making of wounds myself; it is only

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when I have to deal with lacerations and punctures made by other than clean hands and a clean knife that I anticipate infection.

The ground for this confidence lies somewhat in the satisfaction I have had from the use of the blood-clot as described by Schede, and the increased discontinuance of the drainage tube, which so often is an avenue for infection even in wounds clean at the outset.

I will not stop to consider Schede's method in clean wounds, though from my reading and observation of other surgeons' methods I feel that its benefits have not begun to be appreciated. Some of the most modern text-books fail to mention it, or pass it over with a line. When distinguished surgeons still write about a new kind of antiseptic, or fancy they have done great work in the application of a novel style of drain, one cannot but feel that the value of the blood-clot method is not realized, or they would turn their attention to matters other than endeavoring to reach perfection in dressing when nature has provided on tap, as it were, a most beautiful example of conservation.

I am sure that this method offers much reliance to the country surgeon, who does not need to have a great armamentarium of dressings if he properly applies this. It is in the class of accident cases, when there are greatest adverse odds, that I ask attention, and while it is not universally successful, and these cases are not consecutive, for I have had pus cases sandwiched between them, sometimes through my own negligence or untoward curiosity infecting and breaking down a clot, still I think the following examples will show it may be often trusted, and when it fails it does not leave us in a much worse position than if it had not been used.

The first class of cases I shall mention are a series of three gunshot wounds, and are good examples of the advisability of shunning the *nimia diligentia chirurgie* or meddlesome interference. In two of these the ball passed directly into the tissues without taking any foreign matter with it; in the other it traversed only a cotton shirt, which showed no evidence of loss of substance. Except cleansing the neighborhood of the wound and putting on antiseptic gauze and iodoform and a splint if necessary, the

wounds received no further treatment than allowing them to fill up with blood. No effort was made to extract the ball, on the principle that the ball is the least noxious element in gunshot wounds, though its direction was indicated by introducing a sterile probe.

CASE I.—*Gunshot Wound of Skull*.—R. M. D., aged thirty-nine years, white, was admitted to St. Joseph's Hospital, Baltimore, with gunshot wound of skull. In a difficulty with a fellow-workman was shot by latter three feet away with an English bull-dog pistol, 38-calibre. Ball passed through two-inch pattern of wood and entered left ear at juncture of helix and anti-helix. Aseptic probe took downward and backward course (after removal of iodoform gauze with which wound had been stuffed), grated against eroded bone in mastoid process, but its locality was not made out. Wound and parts around cleansed, allowed to fill with blood. Ear packed with iodoform and gauze aseptic dressing applied. Dressing removed for first time in ten days. Wound healed. No rise of temperature or discomfort after recovery from shock. Discharged in ten days, well.

CASE II.—*Gunshot Wound of Face and Neck*.—A. S., colored, married, aged twenty-one years, was admitted to Maryland General Hospital June 29, 1892. Was shot twice by her husband with pistol, calibre about size of cat-rifle.

First ball entered right cheek, which was peppered with powder above the angle of the mouth; direction downward and forward. Second ball entered right side of neck; direction downward and backward. There was considerable effusion of blood along the course of the latter ball in the tissues of the neck, interfering with deglutition and pushing tongue forward to left side. The wounds were not probed, but surface cleaned. Iodoform and antiseptic dressing used. Temperature was 100° on third day. Dressing changed. No pus. Some bleeding. Redressed and discharged, well, in twelve days.

CASE III.—*Gunshot Wound of Elbow*.—D. B., colored, aged twelve years, admitted to Maryland General Hospital with gunshot wound of forearm, inflicted by a cat-rifle, two inches in front of the flexure of the elbow, anteriorly. Probe passed up in direction of joint, but ball not located. Vicinity of wound cleansed, but wound not irrigated. Iodoform, antiseptic dressing and splint applied. Temperature 99° on admission; normal afterward. Discharged in ten days, well.

The next two cases are compound fractures of the skull, differing, however, very much in extent.

CASE IV.—*Compound Fracture of Skull*.—J. R., aged twenty-two years, was admitted to St. Joseph's Hospital October 17, 1892, having been struck by the side of an iron bar in its fall from a roof. Had lacerated wound of occiput. Indentation on external table extending from over torcular herophili toward right ear. Stupid and hard to arouse. Pulse 60, going down in next two days to 40. No paralysis or eye symptoms. No signs of fracture beyond the depression, stupidity and slow pulse. Pared the lacerated edges of wound, let it fill with blood, closed without drain, removed dressing himself the second night, but wound did not become infected. Temperature became normal from 100° on second day. Discharged in two weeks well; states that he has normally a slow pulse.

CASE V.—*Compound Fracture of Skull*.—J. W., white, Pole, aged fifty years, entered St. Joseph's Hospital July 7, 1892, having been struck some hours before by an ore bucket, which lacerated scalp, and crushed in the back of his head like an egg shell. He was dressed with iodoform gauze at time of accident. His condition was one of profound shock, with more or less unconsciousness. Bone was driven into brain substance, about an ounce of which was extruded, longitudinal sinus torn, and when gauze removed bled copiously.

Six pieces of bone, in all a surface about three by three inches, were quickly removed, and to check the hæmorrhage the wound, large enough to hold a hen's egg, was tamponed with iodoform gauze. Lowest pulse 48°.

He was alternately delirious and conscious, singing, tossing and tearing at bandage until morphia gave him quiet. On July 9 the hospital report says, "is quiet this morning, conscious, but totally blind;" sight returning some toward night. Removed the gauze from brain without much bleeding, except enough to fill up the wound with clot. Put in gauze drain at lower angle (where, by the way, there was a little suppuration later), and sewed the wound up.

Continued to improve slowly, with highest temperature at noon of July 10, *i.e.*, 100.5°. Sight gradually returning. The brain pulsations were very evident at first under the scalp. Dressings kept on eight days, when they were removed, and the above-mentioned suppuration noticed, not extending to the deeper parts of the wound nor causing any marked inflammatory or meningeal complications. He

still suffers with dizziness and is unstable on his legs, but is out of the hospital and has otherwise good health. The wound site is now nearly as hard as skull, though there is marked depression.

My next series is three cases of knee injury as follows :

CASE VI.—*Compound Fracture of Patella*.—M. H., colored, aged thirty-three years, was thrown from carriage by runaway horse, and taken to Maryland General Hospital July 3, 1892. Beside contusion he had received a compound stellate fracture of patella of right knee. There was considerable laceration of superincumbent tissue, and easy access by probe and finger to seat of fracture. Three loose pieces of bone were removed after the parts had been washed. The wound was allowed to fill with blood without drainage, and closed by silk sutures. The limb was put in a splint, with ice applications, after dressing with rubber protective, iodoform and bichloride gauze, where it remained untouched for one week. His temperature on admission was 101° . In two days it fell to 99° , and then to normal, where it continued until discharged without further incident of interest on July 23 with a perfectly useful joint.

CASE VII.—*Compound Fracture of Patella*.—H. A., aged twenty-five years, Irish, was admitted to St. Joseph's Hospital September 9, 1892, having sustained a compound fracture of the patella by falling and striking against an iron plate. Iodoform gauze and bandage had been applied before he entered the hospital. There was ample access to fracture, and the lines ran rather in a stellate manner, though the ligamentum patellæ was separated from the bone above. I removed the comminuted fragments, and having pierced the bone with an awl, I united it to the severed ligament with one strong silk ligature, let the wound fill with blood and sewed up the incision without drainage; afterward the gauze bandages and splint were applied. Pain was controlled by morphia and iced cloths, and the dressing remained untouched until two weeks later, when it was removed and the line of incision was completely healed without suppuration. The patient was put on crutches and went about comfortably in his plastic splint. On October 20, six weeks after the accident, the stitches were removed, and in a few days there was quite an extensive stitch abscess, superficial, not involving the joint, which gradually yielded to treatment. He was discharged at the end of ten weeks with a joint capable of some flexion; the stiffness due to its prolonged extension on the splint was gradually yielding to

passive movement. I did not make forced flexion for fear of breaking up the union between the divided ligament and bone. His temperature reached 102° F. forty-eight hours after the accident; fell to 100° next morning, never going much above normal after that until the appearance of the stitch abscess which, being opened, it returned to normal again.

CASE VIII.—*Punctured Wound of Knee Joint.*—This case illustrates the blood-clot treatment of nature almost unassisted, as the injury was done three days before entrance to the hospital. Whether the result would have been as fortunate if the boy had received no further assistance I cannot say.

D. H., aged ten years, colored, fell off a fence on May 30, 1892. He was admitted to Maryland General Hospital June 2, with his knee considerably swollen. There was a punctured wound leading apparently into the joint, though it was not opened up, as it showed signs of closing. His limb was put in a splint with iced compresses, and his subsequent recovery was uneventful. His temperature was 100° on entrance, but normal the next day.

The next two cases are compound fractures of the tibia, complicated with extensive laceration, and in one case a simple fracture on the other side.

CASE IX.—*Compound Fracture of Left Tibia;* simple fracture of right.—W. L. S., aged forty-six years, fireman, white, was run over by hose carriage on May 7, 1892. When taken immediately to the Maryland General Hospital I found extensive laceration of left leg at seat of fracture (upper third), simple fracture of right tibia at lower third, and pronounced shock.

Under ether the compound fracture was dressed by removing the broken spicula of bone, washing the whole surface with bichloride, allowing wound to fill with blood, sewing up the laceration with silk without drainage, antiseptic dressing, with compression and long splint. The dressing having become bloody from the hæmorrhage, a fresh dressing was applied on May 9—the wound, or rather line of incision, looking in thoroughly healthy condition. This was removed a week later, and a plaster splint with a fenestrum applied. At no time was the seat of fracture infected, though toward the end of treatment there was a little superficial suppuration due to the lowered resistance of the soft part from the injury, but the wound in the bone

pursued an aseptic course. His temperature reached 101° on one day, and the case made a good recovery. The simple fracture was put up in plaster.

CASE X.—*Strangulated Testicle*.—G. R., aged twenty years, white, single, upholsterer, had inguinal hernia on left side. While blowing cornet, October 9, felt it descend. Had some symptoms of strangulated hernia, vomiting, pain over tumor. Seen in consultation with Dr. Clewell, October 11. Condition fair; no marked symptoms of strangulated hernia except irreducible, slightly painful tumor in scrotum. The next day a suspicious crackling on pressure in the vicinity of the tumor induced me to cut down over it after reducing a part under anaesthesia. Found sac thickened, but containing no gut or omentum, but below it lay the testicle, gangrenous and emphysematous from a series of twists of the cord, which had cut off the circulation. Removed testicle and sac after tying them near external ring. Closed wound as usual, allowing capillary oozing to form clot, and inserted a sliver of gauze in the lower extremity of the wound in case drainage was needed. It was removed in forty-eight hours, and the incision healed without further trouble.¹

CASE XI.—*Compound Dislocation at Elbow*; fracture of radius at wrist.—B. K., aged nine years, white, fell from a ladder on June 8, 1892, and was admitted to Maryland General Hospital on same day with above-mentioned injuries. The dislocation was of the radius and ulna backward, with about one inch of the humerus and its condyles forced through a lacerated wound on the anterior aspect of the joint. There was also a simple fracture of the radius near the wrist on the same arm. After washing the neighborhood of the dislocation with bichloride, but not introducing it into the wound, under an anaesthetic the dislocation was reduced and the lacerated wound brought together with silk, after allowing it to fill with blood. Antiseptic dressing of iodoform protective gauze, etc., was applied,

¹ I am indebted to Dr. W. W. Keen, of Philadelphia, for his kindness in furnishing me with references bearing on this rare lesion. I append them as follows:

Bryant and Keen, *Lancet*, 1892, Vol. I, p. 472.

N. Y. Med. Record, March 19, 1892, p. 330.

Davies Colley, *Brit. Med. Jour.*, 1892, I, p. 811.

Gervais, *Centralbl. für Chirurgie*, 1892, No. 10, p. 213.

Whipple, *Brit. Med. Jour.*, 1891, I, p. 1226.

Bevan (Bacteriology of Keen's case), *Phila. Med. News*, April 30, 1892, p. 490.

Page, *Lancet*, 1892, II, p. 257.

the fracture at the wrist set, and the whole put in a pistol-shaped splint, where it remained under inspection until June 21, when the wound was found satisfactorily healed. Passive motion was begun later, and the arm is now a useful and flexible member, though there is a slight deformity at the wrist, due to impaction of the fragments, which does not interfere with motion at that joint. His elbow is not even stiff. His temperature was normal after the first day until he had a malarial chill on the thirteenth day, which quickly yielded to quinine.

The last case to which I ask attention, while not a traumatic case, presents so markedly the conditions that I have endeavored to emphasize in the above accidents, namely, infection and lowered resistance of surrounding tissue, that I do not feel it *mal-a-propos* in this series.

CASE XII.—K. C., colored, female, aged forty years, was admitted to the Maryland General Hospital June 1, 1892, with the following history: One year previously her right breast had been removed for carcinoma. In the anterior part of the scar, over the sternum, there was now a recurrence about the size of a tomato or small apple, three inches in diameter, a suppurating growth, ulcerated on top, and extending several inches along the old scar toward the right axilla. The right arm was cedematous, both axillæ presented enlarged glands, and the left breast was a carcinomatous mass, not yet adherent to the skin except in the lower hemisphere. After disinfecting the part as far as possible, the right axilla was first cleared out, then the left, the axillary artery appearing under the knife in both. The whole old scar was excised, including the suppurating growth, and a flap, taken from the upper non-infiltrated surface of the left breast, with its pedicle pointing toward the left shoulder, was transferred to cover the excised tumor and scar. The left breast was then amputated, bleeding checked by torsion, and the sides of the irregular wound brought together by a continuous suture with a small pledget of iodoform gauze in each axilla.

There was no attempt to dry the surface of the wound or to check the oozing, as I wished to avail myself of the blood-clot feature, and trusted to pressure to prevent serious hæmorrhages. The line of incision was then covered with iodoform, protective gauze, and snugly bandaged. When the first dressing was removed (nine days later, I think), union had taken place everywhere, except at the

extreme end of the transferred flap, where tension had caused a small slough, and in each axilla the point of exit for the gauze was, of course, open. I suppose the lines of the irregular incisions must have measured nearly a yard in extent, and were healed throughout, except about two inches in the middle and a quarter inch in each arm pit. These latter closed on removal of the drain; the former granulated. She left hospital much more comfortable, but, realizing the probability of a return, as she had not been deceived about its likelihood.

In these twelve cases I consider that I have had most material assistance in the retained clot. In some there has been a little late superficial suppuration as stitch abscess, but at no time have the deeper parts of the wound been infected, and I am convinced that life has been saved, and joints have been kept useful, from using the natural antiseptics of the blood clot rather than deluging them with necrosis-producing artificial remedies; and right here I would not confine the word antiseptics to the germicide quality of blood clot, for that seems not to be proven satisfactorily, but in its wide sense for the prevention of suppuration, however it acts, for, as Cheyne says: "Aseptic surgery is not treatment by spray, nor by gauze, nor by spray and gauze, nor by carbolic acid, but any method which aims at, and succeeds in, excluding causes of fermentations from wounds."